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ON

THE STATE OF THE MIND  
DURING SLEEP, ETC.

A Paper,

READ TO THE PHYSIOLOGICAL SECTION OF THE  
BRITISH ASSOCIATION,

*ON THE SIXTH OF SEPTEMBER, 1852.*

By R. FOWLER, M.D.

SALISBURY: GEORGE BROWN.  
LONDON: HATCHARD.

TO ONE WHOSE PATRIOTISM HAS NEVER SLEPT,

HENRY, MARQUIS OF LANSDOWNE.

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## P R E F A C E.

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THE principal part of this Essay was read to the Physiological Section of the British Association, at Belfast, 6th Sept., 1852.

My purpose was to prove that during sleep it is the body only that sleeps, and that the suspension of efficient thinking is owing to the relaxed and partially unadjusted state of the organs of sense, thus obstructing the organs of the mind. The analogy of this temporary suspension of thinking to its apparently final suspension in death, seems to have more impressed the mind of Shakspeare than any other writer—

“ Sleep, the death of each day’s life.”

“ And all our little lives are rounded with a sleep.”

“ Sic sine vita vivere heu quam dulce est sic sine morte mori.”

But what may be the state of the mind when

its mortal coil is in the grave? That if recognised as a Force, its analogy to the physical forces when deprived of their coil may admit the expectation of the continuance of its existence, and that consciousness of identity will be revived whenever it may be the will of the Creator to fit it with another coil appropriate to its changed condition after death.

## STATE OF THE MIND DURING SLEEP, &c.

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WHAT is the state of the vital and mental forces during sleep, dreaming, trance, asphyxia, coma, compressions of the brain, intoxication?

The body of an animal is its coil ("mortal coil"), and this, like a federative republic, of which the brain coil is the chief, is composed of a congeries of coils (organs of sense, glands, &c.), and, above all, of a muscular apparatus so adjustable as to enable the mental force to form it into coils for occasional purposes, for expression by speech and gesture, execution of works of art, &c.

In its waking state, the mental force has indirect perception of the adjustments of the muscles by the muscular sense, rendered more sensitive by the blood accompanying every retransmission to the muscular fibres.\*

\* With some analogy to the process by which paper and metallic surfaces are rendered sensitive to retain Impressions from the Chemical Rays of Light.



The mental force has, in addition to perception and volition, a power to modify the adjustments induced by sensations and conceptions, and hence the idea of power.\* It has its sense of buoyancy† and fatigue from

\* This is an active process of the intellect and refutes the opinion that “*Nihil est intellectu, &c.*” The materials for building St. Paul’s are seen alike by the builder and by Sir Christopher Wren, but the conception of the structure was the product of the intellect of them. By changing and modifying the relation of objects and the ideas which they may have excited, the mind forms conceptions of plans for whatever is to be done or invented in all the arts of life.

† Every animal has two surfaces—the skin and the membranes lining the cavities of the body. Impressions on the sentient nerves of either surface project an influence to the cord (spinal marrow) which is retransmitted to the muscles, and felt there by the nerves of muscular sense. Hence the buoyancy felt in all muscles of motion from respiration of laughing gas, from the oxygene imparted to the blood by the nitrous oxide. That this is a cause correspondent to the effect may be inferred from the pain felt by persons from the return of the circulation after suspended animation.

Sir Humphrey Davy, in his experiments, says—that when he had respired a considerable quantity of the nitrous oxide gas, he had a great disposition to laugh, luminous points seemed frequently to pass before his eyes, his hearing was certainly more acute, and he felt a pleasant lightness and power of exertion in his muscles.

Parfaitement massé et comme régénéré, on sent un bien-être universel ; le sang circule avec facilité, et le



the different degrees of compression felt on the sentient extremities of the muscular nerves.\*

That mind and vitality are forces, is as-

jeu de tous les organes se fait sans effort ; on éprouve une souplesse, une légèreté jusqu'alors inconnues : il semble que l'on vient de naître et que l'on vit pour la première fois. Un sentiment vif de l'existence se répand jusqu'aux extrémités du corps : tandis qu'il est livré aux plus flatteuses sensations, l'âme qui en a la conscience jouit des plus agréables pensées ; l'imagination se promenant sur l'univers qu'elle embellit, voit partout de rians tableaux, partout l'image du bonheur.

Si la vie n'est que la succession de nos idées, la rapidité avec laquelle la mémoire les retrace alors, et la vigueur que met l'esprit à en parcourir la chaîne étendue, feraient croire que, dans les deux heures de calme délicieux qui suivent les bains, on vit un grand nombre d'années.—LARREY.

Impressions on the internal surface, as by the laughing gas, excite retransmissions to the muscles adjustable for motion, hence the antics of those who have breathed it. Impressions on the external organs of sense and skin excite internal feelings of pleasure, pain, and efficiency, hence the invigorating effects of cold air and cold water—

“Souls are quickened in a northern sky.”—GOLDSMITH.

Larrey's joyous buoyancy after the warm bath is attributable to the freedom given to the sentient nerves and minute arteries of the skin by cleansing and friction, and to the muscular adjustments by shampooing.

\* Hume challenged the assertors of our having an idea of power to adduce the impression from which it may be inferred ; and here is an adequate impression.

certained by the resistance they can oppose to all the physical forces, to those of gravitation and motion, by mounting a hill or swimming against a rapid stream, by the heavier weight sustained by a living than a dead muscle, and by the fracture of bones by falling without the contact of hard substances. Dead fishes are disintegrated by being frozen, but Sir John Franklin's fish, at Fort Enterprize, were alive when thawed, after having remained frozen thirty-six hours. Men have resisted the effects of temperature, which roasted and boiled butchers' meat.\*

To what source but to mind can we refer the existence and marks of intelligent contrivance on the earth, and in all we have learned of the universe? •

It is an indispensable condition of all force to be latent to our faculties till a fit coil is present. We knew but little of motion, heat, light, gravitation, &c., before the watch, steam-engine, thermometer, barometer, &c., were invented; but the presence of the coil insures the presence of the force, and the

\* See in the Philosophical Transactions Experiments made by Sir Joseph Banks, Sir Chas. Blagden, and Dr. Fordyce; in a chamber heated above 212 degrees.

more perfect the coil the higher the force, as seen in coil for atmospheric electricity.

When asleep, our coil is like a drum unbraced, or harp unstrung—unadjusted, whether for sensation or action. But what is its state when we dream? Few persons can have been so unobservant as not to have been aware that when they have been looking attentively at any single object for about a minute, and then shut their eyes, they continue to perceive a steady image of it. It is this image of a face which a painter transfers to his canvass; for such images are to the mind's eye, what the object looked at appeared to the body's eye.

Again: if we stand with open but unadjusted eyes before a distant lamp, a star, or the moon, so that the light may shine into them without our making efforts to look at it, the object will appear to move in various directions. But it is obvious that it is not the lamp, &c., which moves, but the restless ball of the eye. It is clear, therefore, that the object of the mind in perception, is the sensation which objects, external to the mind, may have impressed on any of our organs of sense, and that such are to the mind's eye what external objects are to the body's eye. Now



such wandering images are the stuff (the dissolving views) of which our dreams are made.

The following physiological account of sensation may afford some explanation of these phenomena. We have, besides the specific nerves of sense, a nerve of sense and a nerve for exciting contractile motion in our muscles, and our organs of sense are adjustable for searching for their objects by such muscles, and it is by the nerve of muscular sense that we get our knowledge of objects, and not by the specific nerve of such sense, which merely informs us of the particular sense by which the object is cognisable.\*

I examined a man who in a fit of insanity had bitten off as much of his tongue as he could thrust from his mouth. Much blood was lost, but he became sane for a time, and when the wound was healed he assured me he could feel with the stump of his tongue a hair, fish-bone, or any small object between his teeth as distinctly as he had before felt such with the tip of his tongue. The fact is we must do and search if we would know, we

\* For this discovery we are indebted to the genius of the late Sir Chas. Bell.

must look to see, and listen to hear, and move our fingers if we would feel distinctly.\*

Now when we dream, our organs of sense retain such a state of adjusted tension as to be excited by impressions or conceptions, and impressions upon vital coils induce definite adjustments (probably by retransmission). If the lips of a comatose patient be rubbed with a spoon before its contents are put into the mouth, the adjustments of deglutition are so accurately made as not to risk suffocation. It is thus intelligible, how suggestive touches induce retransmissive adjustments, by which sleepers and the blind and deaf (feeling by the touch), are enabled to interpret the meaning of others; and questions to persons asleep are suggestive of the adjustments by which they are answered. This is analogous to the suggestive effects of questions in ordinary conversations, but still more palpably of leading questions in courts of justice.†

\* No one can be taught by words alone to write, to knit, to sew, or to execute any work of art.

† Incidental occurrences, whether antecedent or sequent of each other, are reciprocally interpreters of each other. Is it not in this way that circumstantial evidence accumulates?

“One bright idea lighted in the breast,  
By memory’s magic lets in all the rest.”—MOORE.

The less the relaxation of tension (as in the morning) the more vivid the dream. Our belief in our dream (as in the diorama) is not contradicted by objects outside.

When conceptions are vivid, such as belong to the passions, they produce retransmissions to the parts to which the conceptions belong.

Again—That the adjustments required for sensation are the same as those by which conceptions are formed, is proved by various facts—by the experiment of Banks \*—by the murderer, suffering from remorse, having always the image of his murdered child before him.

It is contrived by Benevolence, that like adjustments induce like conceptions. Many repetitions are required to form accurate conceptions. And we must *do* to know, for it is not till we have *done*, that we get the conceptions which form the painter, sculptor, orator, singer, &c. Sir J. Reynolds says, that it was not till he had been at Rome a

\* If a person sitting with his back to the sun looks steadily for a minute on any short word printed in blue and large capital letters, the word will be seen as an ocular spectrum when the eyes are closed with the hand, and on a white or yellow wall when they are quickly opened.



year, that he began to appreciate the works of Raphael.

We know how vibrations induce definite physical diagrams.\* Thus are also definite adjustments induced, and thus identity of impressions is recognised.

*Unadjust* the coil, and the force disappears. This is the sleep of the coil, not of the force. In man, who is, as we have said, a congeries of coils, they do not *all* sleep.†

Feeling in the body, and conception from abiding adjustments of past sensations, are the instructive interpreters of new sensations. Thus the conception of a ship near to us, interprets the perspective appearance of a distant sail. Every known part is suggestive of its whole. A conception already in the mind retransmits such adjustments to the ear, that it interprets the sound of the words sung in music.

Some persons seem to live in a dreaming

\* If dust be strewed on a plate of glass and made to vibrate by the bow of a fiddle, geometrical figures (adjusted forms) will be produced. Like definite figures may be observed on the water of vibrating musical glasses.

† *Dormeo dumblande sentio murmur aquæ.* Persons under the influence of chloroform are said to hear.

state, unadjusted by attention. They do not observe what is passing; for we must look to see, listen to hear, &c. Their impressions and conceptions induce no definite adjustments, and adjustments are, to the perceptive mind, signs of thought.

In profound sleep, we are not aware of more than suspension of consciousness, and are without dreams. In what, then, does this differ from death but in time? "Sleep, the death of each day's life." "But in the sleep of death, what dreams may come?" If my notion of this subject be physiologically correct, the mind is a force acting as physical forces do, each through the medium of its appropriate coil, and returning to a latent state when the coil is withdrawn. A force is not manifested when the coil is not present, any more than thinking is, when the coil is disconnected with *mind force*. What then becomes of the mind? What becomes of any other force? Motion is individualised in a watch—gravitation in a pendulum—heat in a thermometer—and gravitation, again, in a barometer—magnetism in a natural or artificial magnet.

Endow appropriate coils with conscious-

ness\*—as soon as an appropriate coil is presented, the force will, as we observe in all coils, enter it.†

Where, then, is mind when its mortal coil is perishing in the grave? Where are the physical forces when the instruments which they actuated (the pendulum of a clock—a steam-engine—a voltaic trough or a Leyden phial), are broken? Gravitation, motion, heat, and electricity do not cease to exist. They existed before their coils were invented, and will continue to exist when this earth and all material organised structures shall have ceased to exist; and that this will be the condition of the mind, we have abundant reason to expect. It is the mansion, not the tenant that is changed. Mind may still live as distinct from flesh and blood (which is sus-

\* Mr. Locke suggested that consciousness might be a property added to matter, with some analogy to the connexion of matter with the physical forces, and as consciousness is actually added when inflammation occurs in a part insensible in its normal state. Malthus thought the business of this life was to educate matter to form mind.

† The bells of the apparatus for the manifestation of atmospheric electricity ring whenever in a thunder storm two clouds come within striking distance.



tained by food) as is the swimmer from the flood.\*

Professor M'COSH in reference to the very curious speculative paper just read, said "that he really would like to see the section divided, so that the speculative or transcendental portion of it might be distinct from the rest. He was of opinion that Dr. FOWLER had gone far beyond the facts of physiology. It was, of course, quite true that mind has a power over matter, and in that respect it might be described as a force, but it was a force very different from the physical forces with which it had been compared. Mental power did not require a 'coil,' † and in this sense it was very different from electricity or gravitation."

Sir DAVID BREWSTER said "that a friend of

\* The mansion changed, the tenant still remains,  
And from the fleeting stream, repaired by food,  
Distinct as is the swimmer from the flood.

ARBUTHNOT.

† Is the Professor's remark applicable to any mind except that of the Deity? How can it be ascertained that mind can act without its mortal coil, the body? The extension of our coils (organs of sense) by optical and other mechanical contrivances (electric telegraph, steam-engine, &c.), has, in fact, advanced the human mind in respect to intelligence to a higher state of existence even in our life on earth.

his was engaged at present in investigations on the subject of Dr. FOWLER's paper. He fixed his attention on a certain object; and, by marking the time with a watch, recorded his sensations between the period of perfect wakefulness and profound sleep. It might be mentioned as a fact, that different parts of the body fall asleep at different times; and it might, perhaps, be argued by analogy that different parts of the brain fall asleep at different times. It was a fact equally well known, that different parts of the body get intoxicated sooner than others. First, the eyes begin to glaze, then the tongue to get flabby—(laughter)—then the muscles begin to give way in the arms, then in the limbs, and so on. In Scotland experiments of this kind are witnessed every day, though not practiced in their own persons by the physiologists. (Laughter.) There are country gentlemen, who ride home every night from a carouse, on horseback, and are well able to do so, as long as their backs are not drunk; but once the back gets drunk, the certain locality in which to find such gentlemen, is under the mahogany. (Continued laughter.) Experiments had also recently been made to ascertain the different sensitiveness of various

parts of the human body, by means of a pair of compasses. At a distance of only one-eighth of an inch between the legs of the compasses, the two points will be distinguished on some parts of the body, whilst on the back the effect will be that of only one point, unless the compass is stretched several inches."

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### ON THE PROBABILITY OF A FUTURE STATE.

As I have considered the analogy which sleep and all other suspensions of consciousness bear to that long suspension of consciousness which we call death, and as in this view of the subject every nightly suspension of consciousness gives the character of a renewal of life by every succeeding day, I hope the following observations on the probability of a future state will not be deemed an irrelevant intrusion.\*

I think that the probability of a future state may be reasonably inferred from the following considerations:—

\* This view of the subject seems to have been taken by Shakspeare—

“Sleep, the death of each day’s life.”



1. From the permanence of the laws of nature and the physical forces with which our mind and vital forces have correlation.\*

That even in this life we are visibly and tangibly connected by gravitation, motion, light, and the chemical affinities of its rays, with the remotest parts of the universe, and by the correlation of the physical forces with the mind and vitality by which we are animated; and by the progressive manifestation and development of mind, bearing some definite analogy to that which the strength of the physical forces bear to progressive improvements of their coils, and from the certainty which we have that the force still continues to exist undiminished during the interval of its separation from one coil till it is provided with another more fitted to develop its efficiency.†

2. From the constitution of Man, by which

\* See abstract of a Paper read at Ipswich, in Explanatory Notes.

† Before Volta's pile was invented, Professor John Robinson, of Edinburgh College, formed a pile by laying discs of alternate silver and zinc on each other, but without the interposed fluid of Volta's pile. This disappointed his expectation of increased galvanic effect, and he missed the discovery of that pile which immortalized Volta.

we may infer the disposition of the Creator not to disappoint expectation voluntarily excited, for "Hope travels through, nor leaves us when we die."

3. From the apparent incompleteness of some rational purpose, for, without a future, man's progressive intelligence has no intelligible purpose.

That as a man does not invent a piece of mechanism, or begin and continue any important work without some motive, final cause, or purpose, it is not likely that God should not have some one wise purpose in placing him here, and that the most reasonable may be that, as in a School, he may acquire self-control, benevolence, and such accuracy of thinking as may fit him for some more advanced state of existence. But we find that the body (all of man which is cognisable by our senses) is disorganised, disintegrated, and dispersed. What then becomes of his mind, when vitality, one of the forces by which he was animated, has wholly disappeared? But man's WORKS remain. Many there are whose arts yield objects and whose WORKS endure; others have left the impress of their mind in WORDS—sparks of immortality. But words are things, for they

*Words are things, & a small sort of which  
Falling like dew upon a thought produce  
That which makes thousands believe.*

call up conceptions of things which is all of which the mind has cognizance. The Hon. Mrs. Norton's Gipsy Girl is prominently the most vivid proof of this psychological truth that I have known. We see and hear the tortured expression of the writhing lovely culprit as distinctly as if we were with her in her cell, the image of her lover interposed between her and the scaffold.\*

Mr. Burke, in his Essay on the Efficient Cause of the Sublime, says—"So little does poetry depend for its effect on the power of raising sensible images, that I am convinced it would lose a very considerable part of its energy if this were the necessary result of all description."

Mr. Macaulay, in his animated address to his constituents, must, by his glowing words, have raised the patriot Peel, standing and speaking before them, as many must have seen him when animated by debate in the House of Commons.†

\* Thy image stands between my God and me.—POPE.  
Have I not seen thee where thou hast not been.—YOUNG.

It is a law of the mental functions that the less vivid impressions, sensations, and conceptions, are suppressed by the stronger.

† "His figure is now before me—all the tones of his voice are in my ears."



All the knowledge that courts of penal law can have of persons, things, and transactions involving consequences of life and death is by WORDS—the expressive representatives of conceptions. Neither have we knowledge of each other even when in presence of each other, for we do not see each other; the mind, which alone constitutes the I or Me, is invisible, inaudible, and intangible, and is known to others by inferences from our words and expressive looks and gestures, being hidden from others as all physical forces are while latent and inactive in their appropriate coils.

All that we know of GOD is by what we can infer as to his attributes expressed in his WORKS, and by the extension to the Infinite and the Eternal all the intelligent and benevolent faculties which have ever been observed in the wisest and best of men.\*

How, if the mind survive the body, will it recognise its identity? After waking from

\* The Roman Catholic reads as the heading of every prayer—"Put yourself in communication with God." This can be done in no other way than by forming a conception of him by thinking. The admonition is wise, for "Words without thoughts never to heaven go."

sleep, we have intuitive recognition of places, objects, and persons, as like to our recurring conceptions by memory of the like we have seen before; analogous to our intuitive recognition of the intuitive truth of the steps forming a problem for the demonstration of which we have the evidence only of memory of our assent to the truth of the previous processes.

A woodman, after a day's work, left his axe, &c., in the hollow of a tree, and became insane. In this state he remained for fifteen years, oblivious of what had occurred, and the tools were sought for in vain; but soon after he recovered, his memory of his former state of sanity returned, and he went direct to the tree in which he had deposited his axe. And so it may be with us after the suspended animation of death.

A truthful person, who had been under the water for half an hour, and remained unconscious for at least an hour more before the efforts to recover him were successful, told me that he was long before he recognised the people around him. His first words were "What will my master say?"

A butcher who had hung himself, and was with difficulty recovered by a Professor of

Anatomy, Mr. Cruickshank, asked, with great emotion, "What will the world think of me."

While slowly recovering from a fever, during which all consciousness of existence was long suspended, my first proof of personal identity was the recollection of what I had been thinking and writing about immediately before I was confined to my bed. This was my starting point in the renewal of my studies, and is it not probable that on our revival to newness of life after death we may start again for further progression of intelligence from the last point which we had attained in this life? After the suspension of consciousness by death, is it not probable that the first subjects of our attention may be the last that had interested us at the close of this life, and, like giants refreshed, that we, after a refreshing sleep, may awake with more efficient power to surmount the mental difficulties which had impeded our progress here? Many must have felt that obstacles which appeared insuperable, by thinking over-night, were mastered with ease the next morning. "Heaviness may remain for a season, but joy cometh in the morning." Poets have told me that their most brilliant



thoughts have occurred before breakfast. Is it not probable, therefore, that the progressively-improved power of thinking which was our last in this life, will be our first and starting point in any future life that may be assigned to us, as it is to individuals and generations here? The Russians and Americans, started, as our new Colonies are now beginning their political, municipal, domestic, and scientific existence, with all the aids and examples of the parent states. If so, of what immense importance is it that we should, by education, advance this starting point as far as possible in this life.

But how may it be with our individuality and recognition by others? How has it been already with the succession of changes in the mind's coil through which we have already passed, from infancy to boyhood, from boyhood to youth, from youth to manhood, and from manhood to old age? Though we may have passed years away from country and friends, we are still recognised by them on our return; not always by our personal appearance and our likeness to the abiding conception they had formed of us; not by the identity and individuality of our bodies, for every particle may have been

changed;\* not by our opinions, for they, too, may have changed. But by some striking resemblance of functional manner of doing and saying and expressing himself on subjects recognised as done and said and expressed during times past (*lang syne*), and before the suspension of our intercourse.†

A lady, who was an accomplished painter, had not succeeded in taking a satisfactory portrait of her husband while he was living, painted one recognised by all her friends when he was no more. While alive she saw and drew but the expression at the instant before her, when dead she drew from her conception modified from the ever varying

\* A litter of young pigs was fed on madder, and one killed every week, the bones had acquired an additional tinge of red for every week, till the last of half the number was found to be deeply tinged. The madder was then discontinued, and again one was slaughtered in every succeeding week till the whole litter had been disposed of, the tinge of red was found to have become lighter and lighter till in the last no trace of redness remained. Proof that daily changes are going on in the materials of which our bodies are composed.

† Speaking of Mahomet, Mr. Gibbon says—"Could I truly delineate the portrait of an hour, the fleeting resemblance would not equally apply to the solitary of Mount Hera, to the preacher of Mecca, and the conqueror of Arabia."

expression in the various states of mind in which he had so long been endeared to her. Is it not then by a comparison of present with past conceptions that we recognise individuality and identity?

Where is mind after death of coil? It may again be individualised, as physical forces are, as motion in a watch, the magnet in steel, electricity in amber and Leyden phial, light in a glow-worm, &c.

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### ABSTRACT OF A PAPER

READ AT IPSWICH ON MIND AS A FORCE CORRELATIVE  
WITH THE PHYSICAL FORCES.

The author began his paper with some observations of what constitutes force. Our notions of it, he thinks, are acquired very early, from feelings of resistance to our will; for all forces are measured by the resistance they can overcome, *i.e.*, the force they can antagonize. When boys of apparently equal strength and equal courage are seen to wrestle, we are impressed with a belief that he who fairly throws the other has the most powerful muscular (vital) force; but when we see that a spirited boy of comparatively weaker muscular force crows and throws a larger boy of more muscular strength, we then infer that mind was the force in the boy who more than antagonized the vital force of the other. "What," asked Suwarrow, "is the strength of an army?" "The stomach!" was the



answer of his experience ; and the stomach, the source of vital strength, is furnished with its materials by the physical forces of motion, heat, and chemical affinities. Here then we have correlations of mind with the vitality of its coil, and of vitality with the physical forces. Mind and vitality have these analogies with the physical forces :—1st, That all act through the media of coils ; 2nd, that the manifestation of the force is directly as the fitness of the coil, and that wherever an appropriate coil is presented, there the force will be apparent to our senses. The chronometer as the measurer of time by space, the voltaic trough and the coil of Ørsted, and the heat and light from the spontaneous union of hydrogen and oxygen in spongy platina, are satisfactory instances.

The cretin affords an analogous instance with respect to the vital and mental forces. Born with a corporeal coil fitted for both, their manifestation gradually becomes obscure as the body is diseased ; but when again restored by the invigorating air, exercise, food, and social converse of a mountain home, the forces of mind and vitality re-appear : here, is it not mind which devised the reparation of the mortal coil in the case of the cretin, and which has devised the coils which vitality has materialized for all the physical forces ? Had then minds of the highest order been withheld, the physical forces had wanted the coils by which they are now rendered so effective ; and if the physical forces had remained latent, the seed of plants and ova of animals could not have become coils fitted for the activity of vitality and mind.

*Correlation of the Organs of Sense.*—That these might be indifferently the antecedent or sequent of

each other's functions in effecting sensations or conceptions, occurred to the author while in the year 1792 he was preparing a paper on Belief, which he read to the Speculative Society of Edinburgh (see the History of the Society lately published). It is the law of our organs of sense that a sensation or conception in any one should excite a re-transmission to the adjusting muscles of all the other organs. The most palpable instance of an analogous re-transmission from one nerve to many muscles is from the nasal branch of the fifth pair in the act of sneezing.

Doubts have been expressed whether these forces may not be really distinct and independent forces, rather than modifications of one force, as conjectured by Mr. Grove. There are, however, several analogies in support of Mr. Grove's hypothesis. By the modification effected by glands differently constructed, secretion of varied qualities are produced from the blood; different fruits from the same sap, modified by grafts; one thought may be modified as in words that are synonymous, and both the thought and instinct of man or the lower animals are modified by their structure,—“Many administrations, but the same spirit.” As therefore the force is more or less effective in ratio of its coil, and as coils for thinking or acting, in science, in arts, and in the ordinary business of life, are formed by the adjusting muscles of the sentient and voluntary functions of the body, is it not the business of education to drill the coils, by which alone elevation and efficiency can be given to the force of mind?





## EXPLANATORY NOTES.

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### EVIL.

What may be the influence of the evils of life on our future state, whether such as may have been unavoidable, or incurred by heedlessness, or the result of voluntary misconduct?

Evil, not sequent on our own misconduct, may act on us like insult,\* to rouse torpid minds to action, and force a heedless headlong impulse how to think and recover its level, and to emulate minds of a higher order.† The sequent effects of our conduct when not in accordance with the laws of man's nature are evil—but like errors in our progressive education in art or in science, such errors leave in our minds abiding remembrances of what we should avoid when we try again. Bolingbroke, in his “Reflections upon Exile,” says—“If we have applied ourselves betimes to the study of wisdom, and to the practice of virtue, evils become indifferent; but if we have neglected to do so, they become necessary. In one case they are evil,

\* Injuries may be atoned for and forgiven, but insults admit of no compensation. They degrade the mind in its own esteem, and force it to recover its level by revenge.—JUNIUS.

† “To wake the soul by tender strokes of art.”

POPE'S *prologue to “Cato.”*

in the other they are remedies for greater evils than themselves. Zeno rejoiced that a shipwreck had thrown him on the Athenian coast; and he owed to the loss of his fortune the acquisition which he made of virtue, of wisdom, of immortality." Lord Bacon may have owed his immortal discovery of inductive thinking to pungent feelings of compunction, and Shakspeare his surpassing excellence as a thinker and writer to his failure of success as an actor. Many to corporeal defects, as Byron, Pope, Scott,—as the reckless ambition of Richard III. is ascribed by Shakspeare to his deformity. Milton, reviled and scoffed at by courtiers of the Restoration, bounded above their grovelling level through obstructions of blindness, poverty, and neglect by a work, the brightest jewel in his country's crown.

Evil may be intended to awaken our attention to search out hidden causes. "*Felix qui potest rerum cognoscere causus.*" As a call to fellow feeling for the sufferings of others,

"Teach me to feel another's woe  
To hide the fault," &c.

"*Non ignava mali miseris succurrere disco.*" In fact, to impel search, and by searching to supply wants and remove evils, to acquire such intelligence, benevolence, fortitude, courage, all the qualities by which man is ennobled here and fitted for a more exalted hereafter.

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### MUSCULAR SENSE.

From the effects of the nitrous oxyde on the adjusting muscles of the limbs and trunk (recorded

by Sir Humphrey Davy) and the sensation of extended touch, may it not be inferred that these effects on the muscles must have been produced by retransmissions from the sentient extremities of nerves ramified on the arteries of the air cells of the lungs to the adjusting muscles, and there inducing the contractions and impressions on the muscular nerves which excited the involuntary antic motions, and at the same time the sensation of extended touch in every muscle. Is it not to a like process that we may attribute our sensations of buoyancy when after long confinement by sickness we breathe the fresh air of the country. The mad man who, in the asylum of Dr. Finch, in Fisherton, bit off the end of his tongue, and could when the stump was healed both articulate and feel;—to what nerves of sense can the continuance of these functions be referred if not to those of muscular sense? The fact I believe to be this—that we have merely nebulous sensation of the quality of an object appropriate to the organ of sense by which it is recognised by our specific nerve (whether optic, auditory, olfactory, or tactile); but that all our accurate and perceptive sensations are acquired by our muscular nerves, and hence it is that we must adjust our organs of sense to learn all they can tell us: we must look to see, listen to hear, and handle to touch, &c. If the astronomer were merely to let the light of a star shine into his unadjusted eye, he would see it—but he would see it in motion. The retina is most sensitive to light in its centre, and is less and less sensitive from the central point to its circumference.\*

\* There is a continual desire of exercising the sensible spot, the proper seat of vision. When an impression is made upon



Hence it is that to learn the right use of any corporeal function we must do the action we are required to know. The recruit has, it is true, locomotion, but a long drill is required before he can walk. [Sir Charles Bell has furnished the best materials that I have met with for a satisfactory solution of the long-discussed question as to the active or passive state of the mind in the functions of sensation and perception.] Would it not therefore be more correct to say “*conscio*,” or “*sentio ergo sum*,” rather than “*cogito, ergo sum*,” with Descartes. Consciousness of existence is intuitive, but we must learn to interpret our perceptive sensations; and, as to thinking, many pass their lives in such a state of reverie between sleeping and waking, as never to have been at the trouble to work out a thought. Lucretius says of such a man—“*Qui stertis vigilans nec somnia cernere cessas.*”

By the muscular sense the mind is apprised of the state of the muscles by which adjustments for speaking or thinking are formed, and it interprets these adjustments as the observer of the needle at the extremity of the electro-telegraphic wire interprets its adjustments into the thoughts communicated at the beginning of the wire. It must have been thus that Campanella interpreted the thoughts of others by adjusting his lips and the expression of his features

the retina, in that unsatisfactory degree which is the effect of its striking any part but the centre, there is an effort made to direct the axis towards it, or, in other words, to receive the rays from it upon the more sensible centre. It is this sensibility, therefore, conjoined with the action of the muscles of the eye-ball, which produces the constant searching motion of the eye; so that, in effect, from the lesser sensibility of the retina generally, arises the necessity for this exercise of the organ; and to this may be attributed its high perfections.—SIR CHAS. BELL on “The Hand.”



as he saw them in those whose thoughts he was anxious to detect. "When he had a mind to penetrate into the inclinations of those he had to deal with, he composed his face, his gesture, and his whole body, as nearly as he could into the exact similitude of the person he intended to examine; and then carefully observed what turn of mind he seemed to acquire by this change. So that, says my author, he was able to enter into the dispositions and thoughts of people as effectually as if he had been changed into the very men. I have often observed, that on mimicking the looks and gesture of angry, or placid, or frightened, or daring men, I have involuntarily found my mind turned to that passion, whose appearance I endeavoured to imitate; nay, I am convinced it is hard to avoid it, though one strove to separate the passion from its correspondent gestures. Our minds and bodies are so closely and intimately connected, that one is incapable of pain or pleasure without the other. Campanella, of whom we have been speaking, could so abstract his attention from any sufferings of his body, that he was able to endure the rack itself without much pain; and in lesser pains every body must have observed, that when we can employ our attention on anything else, the pain has been for a time suspended; on the other hand, if by any means the body is indisposed to perform such gestures, or to be stimulated into such emotions as any passion usually produces in it, that passion itself never can arise, though its cause should be never so strongly in action; though it should be merely mental, and immediately affecting none of the senses."\*

\* From Burke, on "The Sublime and Beautiful."

## HOW QUESTIONS TO PERSONS WHO TALK IN THEIR SLEEP ELICIT APPROPRIATE ANSWERS.

After a careful examination of many cases of spontaneous retransmission from impressions of touch or articulate sounds (and what are these but touches exciting vibrations and retransmissions), I think I may infer that retransmission excites adjusted motion in parts homologous to the part in which the sensation was felt which excited the touch or words which expressed the feeling—

“If haply these eyes have a soul underneath,  
By whose flame their expression is lighted.”—MOORE.

This will, I think, be found to be one of the laws of retransmission; another is that motor influence is retransmitted to the adjusting muscles of the part whose function is to be excited to activity. Thus any irritation in the eye on the cornea, whether light, dust, or an insect, excites retransmission in the lachrymal arteries to wash it away, and to the eyelids to shut out whatever might add to the irritation. Innumerable instances of this kind will occur to all who are familiar with such subjects. To the first of these laws may be referred fellow feeling excited by expressions of all emotions and passions—

“The lesson of pity was caught from her eye,  
And ere words were my own I spoke with a sigh.”

GEN. BURGOYNE.

Panic, party and sectarian feeling may be referred to this law, and possibly the gregarious propensities of some animals. The quality of the impression is the antecedent, exciting the retransmission, and the retransmission determines the sequent functional

motion. This may bear some analogy to the touch and breathing of persons playing on wind instruments. Here the degree and duration of the antecedent touch and articulate breathing determine the sequent impression which excites the feeling of an audience, and are interpreted by whatever is already in the mind of each. This is beautifully and philosophically exemplified in Dryden's Ode, "Alexander's Feast"—"As the fool thinks, so the bell tinkles." I could not hear the words that Phillips was singing till they were repeated to me ; I then heard them distinctly—"The people that walked in darkness have seen a great light." I seldom hear the words of a chant till I see them, or recognise a face till I hear the voice of my friend whom I meet in a dubious light. Then, from the impression on the ear an adjusting influence is retransmitted to my eyes, and I distinguish the features which I had not recognised before. Hence it is that we most distinctly hear persons who speak to us if we see them. When once a thought is fairly domesticated in the mind, the slightest suggestive impression will recall it.

"But ever and anon of griefs subdued  
 There comes a token like a scorpion's sting,  
 Scarce seen, but with fresh bitterness imbued ;  
 And slight withal may be the things which bring  
 Back on the heart the weight which it would fling  
 Aside for ever : it may be a sound—  
 A tone of music,—summer's eve—or spring,—  
 A flower—the wind—the ocean—which shall wound,  
 Striking the electric chain wherewith we are darkly bound ;  
 "And how and why we know not, nor can trace  
 Home to its cloud this lightning of the mind,  
 But feel the shock renew'd, nor can efface  
 The blight and blackening which it leaves behind,



Which out of things familiar, undesign'd,  
 When least we deem of such, calls up to view  
 The spectres whom no exorcism can bind,  
 The cold—the changed—perchance the dead—anew,  
 The mourn'd, the loved, the lost—too many!—yet how few!"

It is thus that instinctive propensities or thoughts within us are the faithful interpreters of impressions, whether from within or from without.

"Blowsy Bell, with downcast eyes,  
 Sighs, but knows not why she sighs,  
 Tom is by her, he knows why," &c.

We are indebted for the pranks imputed to Queen Mab to Shakspeare's profound knowledge of this law of our nature; and of late these truths are said to have been simulated for purposes of interest and fraud.

The more carefully the laws of the material, the vegetable, the animal and mental relations have been hitherto investigated, the more clearly does it appear that there is no chance, all direction; no discord, all harmony; all adjusted by weight and measure, quality, space, and definite proportion. The largest masses of matter effect movements of years with precision of seconds of time, and antecedent impressions on animals and plants have equally definite sequents, action of body, and thoughts of mind, so that "one bright idea lighted in the breast (brain), by memory's magic (probably effected by retransmitted influence) lets in all the rest," whether we are sleeping or waking, or, as Goody Quickly, have not acquired a controul of our train of thinking by interposed volition. Hence it is probably only by a question, the natural antecedent of which we wish to elicit, that we can hope to obtain



it from a person talking in sleep. There are minds that (like animals who seem to have direct perception of objects) see at the first glance\* the sequent to every antecedent presented to them. Thus, Sir Isaac Newton is said to have had correct perception of the result of a demonstration the moment he had read the enunciation. Is it not this instinctive perception of the appropriate sequent to every antecedent which constitutes genius, whether for acting, as Wellington and Napoleon, or for speaking and writing, with a *verve*, as Byron, Moore, or Scott, Fox, Palmerston, or Brougham?

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### FORMATION OF A CONCEPTION.

Any abnormal and distorted adjustment of our coils (organs of sense) must distort the impressions, hence wrong sensations proceed and wrong conceptions are formed. From such derangement of the coils distorted conceptions, hence insanity. Dr. Finch told me he had observed "The senses are often seriously affected, and from the impression conveyed to the mind through them the greatest delusions and erroneous inferences are acquired. From affections of the ear false sounds are felt (heard), and patients sometimes will reply to those sounds, and hold a conversation with a supposed object: others, from the palate being vitiated, will refuse their food, under an impression of its being poi-

\* I have discovered (says Sir Wm. Hamilton), and by a wide induction established, that the power of regulating motion at birth is in all animals governed by the development at that period of the cerebellum in proportion to the brain proper. Is this law to be extended to the faculty of determining distance by sight?

soned. The olfactory nerve being affected, the smell becomes vitiated, and they refuse their food, supposing it to be of a poisonous or corrupt nature. Sight carries a corresponding inference." Now the converse of this is true. The distorted impressions or rather figures reflected from a polished metallic cone or the mirror of a kaleidoscope are reflected to our eyes restored to a normal figure, hence the calculation and care required in forming the curve and the polish of the speculum of such telescopes as Lord Rosse's.

The influence from all similar instances of distorted or obstructed coils is that mental perceptions are perverted or suspended, and that so far we are spiritually dead, analogous to what we are rightly said to be when correct thinking is suspended or interfered with by irregular functional working of our organs, whether of sensation or action by disease from sensual habits. Hence, when such habits are suspended by change of conduct we again are restored to our usual health and the capacity of thinking, we have, in fact, newness of "Spiritual Life."\*

\* Sir H. Halford has published one of the most remarkable instances of this fact that has been recorded.

#### THE GIPSY GIRL.\*

She lies crouched up upon her pallet bed,  
Her slight limbs starting in unquiet sleep;  
And oft she turns her feverish restless head,  
Moans, frets, and murmurs, or begins to weep.  
Anon a calmer hour of slumber deep  
Sinks on her lid—some happier thought hath come;  
Some jubilee unknown she thinks to keep

\* From MRS. NORTON'S "Child of the Islands."

With liberated steps that wander home,  
 Once more with gipsy tribes, a gipsy life to roam.  
 But no, her pale lips quiver as they moan  
 What whisper they? A name and nothing more,  
 But with such passionate tenderness of tone  
 As shews how much those lips that name adore.  
 She dreams of one who shall her loss deplore  
 With the unbridled anguish of despair,  
 Whose forest wanderings by her side are o'er,  
 But to whose heart one braid of her black hair  
 Were worth the world's best throne and all its  
     treasures rare.

The shadow of his eyes is on her soul ;  
 His passionate eyes that held her in such love,  
 Which love she answered, scorning all control  
 Of reasoning thoughts which tranquil bosoms move.  
 No lengthened courtship it was his to prove,  
 (Gleaning capricious smiles by fits and starts,)  
 Nor feared her simple faith lest he should rove,  
 Rapid and subtle as the flame that darts  
 To meet its fellow flame shot passion through their  
     hearts.

Animal beauty and intelligence  
 Were her sole gifts ; his heart they satisfied  
 Himself could claim no higher, better sense,  
 So loved her with a love, wild, passionate, intense.

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## IDENTITY.

Identity not so much by fixity of form and feature  
 as by like thoughts and expressions of thought to our  
 previous conception both of ourselves and others ; and



so it is with the identity of conceptions which are materialised in optical and mechanical engines and instruments. It is the thought and its expression which the patent secures and recognises, and not the materials of its coil. General Paoli said of Herschell that he had secured his immortality, for he had placed his monument in a star. "Whatever," says Dr. Johnson, "withdraws us from the power of our senses, whatever makes the past, the distant, or the future predominate over the present, advances us in the dignity of thinking beings." But these are mere conceptions, and we ourselves must have had existence as conceptions before we were encased in our mortal coil as embryos, as infants, and cognisable to ourselves by our conceptions of others.

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## SLEEP.

No one can be more aware than is the writer of these pages how little he has done to elucidate the obscurity which still prevents us from deciphering the phenomena of sleep. The most difficult part of it, CONSCIOUSNESS, has, however, been so successfully investigated by Dr. Holland, I allude to his chapters on Mental CONSCIOUSNESS, that I confidently expect a more distinct view of this nebulous subject will be obtained by his persevering consideration of it.

The most interesting point in the subject of sleep is the analogy which it bears to death, when all consciousness is suspended. But this analogy is depen-



dent on the coil, and in death the mind force has no coil detectable and cognisable by our senses.

Consciousness is dependent not merely on our coil, but on condition of the nerves of the coil not detectable by the microscope or any other means hitherto devised. For though Sir Charles Bell had the sagacity to distinguish which were the sentient and which the motor nerves of muscles, no one has detected in the structure or component parts of these nerves why one is a conductor of sensations to the brain, and the other in every muscle the conductor of a motor force from the mind to the muscle. It is possible that this difference may wholly consist in a difference in the relative position of the atoms of a nervous fibre. Concussion of the brain and pressure on a nerve, whether the conductor to or from the brain, equally derange the position of the elementary parts of their structure, and suspend their functions.

I think it may be proved that consciousness depends on our attention to the muscular sense. We have not only no sensations, but no consciousness from the mere contact (without motion) of our fingers on a table, or of the whereabouts of our feet and legs in bed till we have moved them.

Whether the force heat is passing into or out of any part of our body it is the same unchanged force, but how different are our sensations; and to what can this difference be ascribed, but to the difference in the relative positions of the surfaces of the parts of the structural atoms to the current of heat.

In the relaxation of our muscles during sleep, and their state of tension while we are awake, I doubt whether any other difference would be detectable in their fibres than in the difference in the positions of

their atoms from each other, and ascertainable by the measure of the length of muscles in their relaxed or contracted state. In what but in the relative positions of the chessmen on the board consists the difference between its different games.

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\* See Extract from Burke on Campanella, page 34.

† "All forces act through the medium of coils (and brain is the coil of mind. Vain was the boast of the ancient stoics that the human mind) is independent of the body, and impenetrable to external influences."—Dr. ROGET.

"Marvel not," says Pascal, "that this profound statesman is just now incapable of reasoning justly; for behold a fly is buzzing round his head. If you wish to restore to him the power (force) of correct thinking, you must first chase away the fly holding in thralldom that exalted reason and that gigantic intellect which govern empires and decide the destinies of mankind."



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